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EXAMINER	
LEE, RICHARD J	
ART UNIT	**PAPER NUMBER**
2613	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/938,337	Applicant(s) SUN ET AL.	
	Examiner Richard Lee	Art Unit 2613	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3* is/are allowed.

6)☒ Claim(s) *1,2 and 4-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 2, 4-6, 8, 9, and 24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The newly claimed feature of "deriving local motion vectors from the global motion vectors in the encoded macroblock bit stream" as shown in claim 1 is not supported by the Specification. The Specification, at page 6, lines 16-17, teaches that "The x and y pixel positions are then used along with the global motion vectors 70 as previously described in EQ. 1 to generate local motion vector 80", and the Specification at page 9, lines 11-14, teaches that "If GMVC coding is used, the global motion parameters estimated in box 122 are added to the encoded bit stream 109 along with the code words that indicate which coding mode is used for the MBs". It is clear from these passages that the Specification at most teaches that the global motion vectors are used to generate the local motion vector, and that global motion parameters are later coded in the encoded bit stream. Even though the applicants have indicated at page 8 of the amendment filed July 30, 2004 that support is described in the Specification with regard to Figures 3-8, it is however submitted that the closest teachings in the Specification as explained in the above clearly does not provide support for "deriving local motion vectors **from the global motion vectors in the encoded macroblock bit stream**" as currently claimed.

3. Claims 4, 8, 9, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

For examples:

(1) claim 4, line 2, "the global motion parameters" shows no clear antecedent basis;

(2) claim 8, line 3, "the global motion parameters" shows no clear antecedent basis;

(3) claim 9, line 3, "the global motion parameters" shows no clear antecedent basis;

(4) claim 24, line 1, "the local motion parameters" shows no clear antecedent basis; and

(5) claim 24, line 2, line 4, "the global motion parameters" shows no clear antecedent basis.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 7, 16-18, 20, 21, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki (6,256,343).

Suzuki discloses a method and apparatus for image coding as shown in Figures 1, 2, and 4-6, and the same method for coding or decoding an image, and encoder as claimed in claims 7, 16-18, 20, 21, and 23, comprising the same receiving an encoded bit stream including macroblocks identified as global motion vector coded and either copy type or residual type (see INTRA/INTER switch 3-1, 3-2, 3-3 of Figure 4, column 5, lines 13-55, and 30-1, 30-2 of Figure

6); receiving no local vectors in the encoded bitstream for the macroblocks identified as global motion vector coded (i.e., the global motion vector mv2 of Figures 4 and 6 as coded in coder 8 does not include local vectors in the encoded bitstream, see column 9, lines 47-49); deriving local motion vectors only for the global motion vector coded macroblocks and using the derived local motion vectors to identify reference blocks in a reference frame (see column 10, lines 14-39); copying the identified reference blocks for the copy type macroblocks (i.e., in the INTRA frame coding mode, identified reference blocks are copied into the macroblocks, see 3-1, 3-2, 3-3 of Figure 4, see column 5, lines 13-55); adding encoded residuals to the identified reference blocks for the residual type macroblocks (i.e., in the INTER or INTER4V mode, interframe coding provides the adding of encoded residuals between to the identified reference blocks, see 3-1, 3-2, 3-3 of Figure 4, see column 5, lines 13-55); a processor (see Figures 4 and 6, and column 10, lines 14-39) encoding an image frame by encoding a set of global motion estimation parameters for an image frame and identifying macroblocks in the image frame that have local motion estimation parameters derived only from the global motion estimation parameters (i.e., local motion estimation parameters at the output of 30-3 of Figure 6 are derived from global motion estimation parameters at the output of 30-2 of Figure 6) and no local motion estimation parameters are included in the encoded frame for the identified macroblocks (i.e., the global motion vector mv2 of Figures 4 and 6 as provided to the coder 8 of Figure 4 represents the encoded frame for the identified macroblocks, and which encoded frame does not include local motion estimation parameters, see column 9, lines 47-49); wherein the local motion estimation parameters are used to identify locations in a reference frame that are used to generate images for the identified macroblocks without the global motion estimation parameters generating or

modifying the reference frame (see column 3, lines 21-28, column 6, lines 39-67, column 10, lines 14-39); wherein the processor compares the global motion estimation parameters with block motion estimation parameters to determine which macroblocks use the local motion estimation parameters derived from the global motion estimation parameters (see column 10, lines 14-39); wherein the processor identifies macroblocks that are directly copied from reference blocks pointed to by the local motion estimation parameters derived from the global motion estimation parameters (i.e., in the INTRA frame coding mode, macroblocks are directly copied from reference blocks, see 3-1, 3-2, 3-3 of Figure 4, see column 5, lines 13-55, column 10, lines 14-39); wherein the processor encodes residuals for identified macroblocks (i.e., in the INTER or INTER4V mode, interframe coding provides residuals for identified macroblocks, see 3-1, 3-2, 3-3 of Figure 4, see column 5, lines 13-55) but no local motion estimation parameters (i.e., global motion estimation device 30-1 of Figure 6 produces global motion vector mv2 , representing the global motion parameter and which does not include local motion estimation parameters, see column 9, lines 47-49, column 10, lines 14-39); and wherein the macroblocks are N x N pixel arrays, where N is an integer, and the subblocks are M x M pixel arrays, where M is an integer less than or equal to N (see column 1, lines 40-49, column 5, lines 13-27).

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 2, 5, 6, 8, 9, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki as applied to claims 7, 16-18, 20, 21, and 23 in the above paragraph (5), and further in view of Shimizu et al of record (US 2003/0174776 A1).

Suzuki discloses substantially the same method for coding or decoding an image, and encoder as above, further including providing global motion parameters (i.e., 30-1, 30-2 of Figure 6) associated with a current image frame; deriving local motion vectors (i.e., 30-3 of Figure 6, and see column 10, lines 32-39) for individual macroblocks in the current image frame; using the local motion vectors to identify reference blocks in a reference frame without generating or modifying the reference frame (see column 3, lines 21-28, column 6, lines 39-67, column 10, lines 32-39); using the identified reference blocks to encode or decode the macroblocks in the current image frame (see column 1, line 50 to column 2, line 37, column 3, lines 21-28, column 10, lines 32-39); providing/identifying four global motion vectors associated with corners of the current image frame (see column 1, line 50 to column 2, line 12, column 9, lines 50-63, column 10, lines 14-39, Figures 5 and 6); generating the local motion vectors by interpolating the four global motion vectors to locations of the macroblocks in the current image frame and interpolating the global motion parameters to pixel location associated with the macroblock (i.e., the four global motion vectors are interpolated in the local motion estimation device 30-3 since the local motion estimation device performs local motion estimation in the INTER mode between the global motion compensated picture (i.e., as provided by global motion vectors) and the input picture s1, thereby producing local motion vectors, see column 10, lines 32-39), using a result of the interpolation to identify a location in the reference frame and using contents of the reference frame at the identified location to generate image data for the

macroblock (i.e., as provided by the local motion estimation device 30-3, see column 10, lines 32-67); using the derived local motion vectors to identify reference blocks in the reference frame that are substantially the same as the macroblocks in the current image frame (see column 3, lines 21-28, column 10, lines 14-39); encoding the macroblocks as copy type macroblocks that are decoded by copying the identified reference blocks into macroblocks (i.e., in the INTRA frame coding mode, identified reference blocks are copied into the macroblocks, see 3-1, 3-2, 3-3 of Figure 4, see column 5, lines 13-55); identifying residuals between the reference blocks and the macroblocks, and encoding only the residuals for the macroblocks (i.e., in the INTER or INTER4V mode, interframe coding provides residuals between reference blocks and the macroblocks, see 3-1, 3-2, 3-3 of Figure 4, see column 5, lines 13-55); encoding some of the macroblocks in the current image frame using global motion vector coding where the global motion parameters are used to generate local motion vectors (see column 1, line 50 to column 2, line 12, column 10, lines 14-39), and encoding other macroblocks in the current image frame using another coding scheme (i.e., INTA and INTER frame coding schemes, see column 5, lines 13-55); generating subblock local motion vectors for individual subblocks in the same macroblocks using the global motion parameters, identifying individual reference subblocks in the reference frame pointed to by the subblock local motion vectors, and separately encoding and decoding the subblocks using the identified reference subblocks (see column 1, line 40 to column 2, line 12, column 3, lines 21-28, column 10, lines 14-39).

Suzuki does not particularly disclose, though, deriving local motion vectors from the global motion vectors in the encoded macroblock bitstream for individual macroblocks in the current image frame as claimed in claim 1. It is noted that Suzuki does teach the particular us of

a local motion estimation device 30-3 for performing local motion estimation in the INTER mode between the global motion compensated picture and the input picture s1, but Suzuki does not particularly disclose deriving local motion vectors from the global motion vectors in the encoded macroblock bitstream for individual macroblocks in the current image frame as claimed. However, Shimizu et al discloses a motion vector predictive encoding system as shown in Figures 1, and 9-11, and teaches the conventional calculation of local motion vectors based on global motion vectors in the encoded macroblock bitstream for individual macroblocks in the current image frame (see pages 2-3, sections [0030], [0031], [0032], page 5, sections [0051], [0054], page 6, section [0084], step S5 of Figure 1). Therefore, it would have been obvious to one of ordinary skill in the art, having the Suzuki and Shimizu et al references in front of him/her and the general knowledge of local and global motion estimations within video coders, would have had no difficulty in providing the global motion vectors of Shimizu et al as part of the global motion parameters within local motion estimation unit 30-3 of Suzuki in order to derive local motion vectors in the encoded macroblock bitstream for individual macroblocks in the current frame for the same well known more accurate estimation of local motion based on global motion vector parameters purposes as claimed.

8. Claims 10, 11, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (6,256,343).

Suzuki discloses substantially the same method for coding or decoding an image, and encoder as above, but does not particularly disclose a decoder comprising a processor receiving encoded image frames wherein a common set of global motion estimation parameters are included in the encoded image frames for identified macroblocks and no local motion vectors are

included in the encoded image frames for the identified macroblocks, the processor deriving local motion vectors for the identified macroblocks, from the global motion estimation parameters, using the derived local motion vectors to identify reference blocks in a current reference frame, and then using the reference blocks to reconstruct the macroblocks in a current frame, wherein the processor generates the local motion vectors by interpolating the global motion estimation parameters to locations of the macroblocks in the current frame, and wherein the processor uses the global motion estimation parameters to generate local motion vectors for different subblocks, the processor using the local motion vectors to identify different reference subblocks in the current reference frame and then using the identified reference subblocks to reconstruct the subblocks in the current frame as claimed in claims 10, 11, and 15. It is to be noted that it is considered obvious to produce a complementary decoder and all the decoder specific functions to an already known encoder with the encoding specific functions. With this in mind, it is therefore considered obvious to provide the complementary decoder with the specific decoding functions such as processor for receiving encoded image frames and the reconstruction of subblocks in the current frame as claimed in view of the already known encoder as shown in Figures 4 and 6 of Suzuki with specific encoding functions. Therefore, it would have been obvious to one of ordinary skill in the art, having the Suzuki reference in front of him/her and the general knowledge of encoders and decoders, would have had no difficulty having known the encoder as shown in Figures 4 and 6 of Suzuki to provide the complementary decoder with the specific decoding functions as claimed for the same well known decoding of video data for viewing purposes as claimed.

9. Claims 4, 12-14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki '343 and Shimizu et al as applied to claims 1, 2, 5-11, 15-18, 20, 21, and 23 in the above paragraphs (5), (7), and (8), and further in view of Suzuki et al of record (6,205,178).

Suzuki discloses substantially the same method for coding or decoding an image, and encoder as above, but does not particularly disclose, though, the followings:

(a) generating codewords that identify the macroblocks that use the global motion parameters to generate associated local motion vectors; and generating codewords that identify the macroblocks that derive the local motion estimation parameters only from the global motion estimation parameters as claimed in claims 4 and 19; and

(b) wherein the processor within a decoder detects code words included along with the encoded image frames that identify global motion vector coded macroblocks that do not have associated local motion vectors in the encode image frames, wherein the code words indicate when the macroblocks are a direct copy of the reference blocks, and wherein the code words indicate when residuals are added to the reference blocks to reconstruct the macroblocks as claimed in claims 12-14.

Regarding (a) and (b), Suzuki et al discloses a video coder as shown in Figures 6, 7A, and 7B, and teaches the conventional use of codewords generated to identify macroblocks that derive the global motion parameter and local motion estimation parameter processings (see Figures 7A and 7B). In addition, since the codewords as generated from the encoder is already known, it is considered obvious that the complementary decoder as provided by one skilled in the art would certainly have the capability to detect the code words included along with the encoded image frames that identify global motion vector coded macroblocks that do not have associated local

motion vectors in the encode image frames, wherein the code words indicate when the macroblocks are a direct copy of the reference blocks, and wherein the code words indicate when residuals are added to the reference blocks to reconstruct the macroblocks as claimed. Therefore, it would have been obvious to one of ordinary skill in the art, having the Suzuki and Suzuki et al references in front of him/her and the general knowledge of codeword data within MPEG headers, would have had no difficulty in providing the codewords for identifying the macroblocks that derive the global motion parameter and the local motion estimation parameter processings as taught by Suzuki et al for the encoder of Figure 4 of Suzuki et al as well as the complementary decoder with the capability to detect the code words included along with the encoded image frames that identify global motion vector coded macroblocks that do not have associated local motion vectors in the encode image frames, wherein the code words indicate when the macroblocks are a direct copy of the reference blocks, and wherein the code words indicate when residuals are added to the reference blocks to reconstruct the macroblocks in view of the already known encoder header data of Suzuki et al for the same well known compliance to the MPEG encoding and decoding processing of macroblocks with the use of header data purposes as claimed.

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki '343 as applied to claims 7, 16-18, 20, 21, and 23 in the above paragraph (5), and further in view of Eleftheriadis et al of record (6,055,330).

Suzuki discloses substantially the same method for coding or decoding an image, and encoder as above, but does not particularly disclose wherein the processor performs run length coding on the encoded image frame as claimed in claim 22. However, such technical features

are well known and made obvious by Eleftheriadis et al (see 252 of Figure 2, and column 7, lines 53-54). Therefore, taking the combined teaching of Suzuki and Eleftheriadis et al as a whole, it would have been obvious to provide the run length coder of Eleftheriadis et al after the quantizer 5 of Figure 4 of Suzuki for the same well known run length coding of quantized data in order to form an MPEG bitstream purposes as claimed.

11. Claim 3 is allowed.

12. Due to the above new grounds of rejections, the Examiner wants to point out that only pertinent arguments from the amendment filed July 30, 2004 will now be addressed.

Regarding the applicants' arguments at page 8 of the amendment filed July 30, 2004 concerning claim 10 and in general that Suzuki teaches away from this limitation by stating that the local motion compensation is performed using the global motion compensated picture as a reference picture, the Examiner respectfully disagrees. It is submitted that the local motion vectors as provided from estimator 30-3 of Suzuki are nevertheless derived to identify the reference blocks (i.e., the use of the global motion compensated picture as the reference picture, see column 10, lines 32-67) in a current reference frame (i.e., input picture s1), and then using the reference blocks to reconstruct the identified macroblocks in a current frame (i.e., as provided by the block matching/searching within the motion estimator 30-3, see column 10, lines 32-67).

Regarding the applicants' arguments at page 9 of the amendment filed July 30, 2004 concerning claims 7, 10, and 16, the Examiner wants to point out that such arguments have been addressed in the above rejection.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any response to this final action should be mailed to:

Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications; please mark "EXPEDITED PROCEDURE") (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Lee whose telephone number is (703) 308-6612. The Examiner can normally be reached on Monday to Friday from 8:00 a.m. to 5:30 p.m, with alternate Fridays off.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group customer service whose telephone number is (703) 306-0377.

RICHARD LEE
PRIMARY EXAMINER

Richard Lee/rl
1/5/05